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ICIMOD Position Paper

Food Security in the Hindu Kush-Himalayan Region

Introduction

The world has been experiencing a dramatic surge in the price of many staple foods since 2005. The prices of cereals and oil have almost doubled in just one year (Table 1). Soaring food prices and market instability have led to a threat to food security[1]. This is particularly true for the population of the Hindu Kush-Himalayan (HKH) region.

As a result of their gradual integration into regional and global markets, mountain societies in the HKH region have been moving increasingly from subsistence farming to market-based agricultural production and cash crops[2]. Although this process has been ongoing for the last few years, the present high food and energy prices and market instability are posing new development and environmental challenges. For example, a vast area of the HKH region consists of rangelands, where 30 million people depend on livestock for their

Table 1: **Soaring Food Prices**

		Food Price Index[a]	Meat[b]	Dairy[c]	Cereals[d]	Oils and Fats[e]	Sugar
2004		114	118	130	108	117	92
2005		117	121	145	105	109	127
2006		127	115	138	123	117	190
2007		156	121	247	169	174	129
2007	June	150	120	252	156	170	119
	September	170	124	290	192	190	125
	December	186	123	295	220	226	137
2008	January	196	126	281	236	250	154
	February	215	128	278	279	273	173
	March	218	132	276	278	285	169
	April	215	132	266	279	276	161
	May	216	141	265	271	280	155
	June	216	135	263	274	292	156

[a] Food Price Index: average of price indices of 6 commodity groups (FAO 2008a)

[b] Meat Price Index: average of poultry, bovine, pig, and ovine meat prices (FAO 2008a)

[c] Dairy Price Index: average of butter, skim milk powder (SMP), whole milk powder (WMP), cheese, and casein prices, weighted by world average export trade shares for 1998-2000 (FAO 2008a)4 Cereals Price Index: average of wheat, maize and rice prices (FAO 2008a)

[d] Oils and Fats Price Index: average of prices of 11 different oils (including animal and fish oils) weighted by average export trade shares for each oil product for 1998-2000 (FAO 2008a)

[e] Sugar Price Index: Index from the International Sugar Agreement prices

Source: FAO 2008a

[1] Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (World Food Summit 1996).

[2] For example, the areas under apples and apricots grew by 2.37% and 2.36% per annum, respectively, in North West Frontier Province (NWFP), Pakistan between 1981 and 1994; and the area under citrus fruits and apples increased by 3.4% and by 1.6% per annum, respectively, between 1981 and 1992 in Himachal Pradesh, India. Similarly, in Bhutan, the area under apples increased by more than 30% between 1986 and 1995. Considerable expansion of horticultural crops, particularly apples and citrus, also took place in Nepal during the same period, Similar trends are observed in the mountain areas of China, particularly in Yunnan, Sichuan and Tibet Autonomous Region (TAR). In Yunnan, the area under apples and oranges increased at a rate of 4.93% per annum between 1983 and 1997, while in Sichuan and TAR, the annual growth rate of horticultural crops, apples, oranges, and pears was more than 1% per annum (Tulachan 2001). Besides horticultural crops, ginger, turmeric, and tobacco are also growing fast in the HKH region. The area under tobacco in Sichuan andYunnan in China and the Chittagong Hill Tracts of Bangladesh has grown considerably.

livelihoods. In these parts of Afghanistan, Bhutan, China, India, Nepal, and Pakistan, livestock production, particularly for meat and wool, plays a major role in food security and income generation. These people are now facing extreme difficulties as the price of their staple foods has almost doubled in the last two years, whereas the price of meat and wool has remained almost stagnant (Table 1).[3]

These price changes have posed a new challenge for the HKH region, as mountain communities are particularly reliant on external sources of food supply. The opportunities for intensive arable agriculture are limited by the biophysical conditions which are characterised by rugged mountains, steep slopes, high altitudes, harsh climates, and a fragile environment. The present paper analyses the factors driving the present crisis from ICIMOD's mountain perspective, examining the consequences of our policy on food security, and assessing the need for adjustment.

Factors Driving the Food Crisis

In order to design any strategy or action, it is necessary to understand the factors responsible for the exceptionally high food prices and resultant food insecurity. Studies undertaken by the Food and Agriculture Organization (FAO) and the International Food Policy Research Institute (IFPRI) show that at global and aggregate levels, globalisation, increased demand for food grain (stemming from an ever-increasing demand for food, feed, and feedstock [raw materials for biofuels]), high energy prices, economic growth and a poor supply response (due to a relatively low investment in agriculture[4]), and adverse weather and climate conditions in certain areas of the world are the primary factors responsible for worsening food security globally (von Braun 2007; FAO 2008b). According to FAO and IFPRI, the world's food supply has failed to cope with the increased demand driven by high economic growth and the population increase. While the demand for cereals for food, feed, and feedstock has been increasing steadily; the world's cereal production has remained stagnant in recent years for several reasons, including adverse weather and a decline in yield. The consumption of cereals has been consistently higher than production since 2000, with the exception of 2004 (Table 2). The shortfall in production has been covered by reducing cereal stocks. As a result, global cereal stocks have been declining constantly since 1999. While in 1999, cereal stocks were about one-third of consumption; in 2007 the stock dropped to only 15% of consumption. In 1999, the world food stock was able to support 111 days of consumption; in 2007 it declined to 55 days.

Table 2: **World Grain Production, Consumption, and Stock (in million tonnes)**

Year	Production	Consumption	Surplus or deficit	Stock		
				Total	Share of consumption	Days of consumption
1997	1879	1825	54	541	29.64	104
1998	1875	1835	40	578	31.50	112
1999	1871	1854	17	585	31.50	111
2000	1838	1855	-17	564	30.40	107
2001	1870	1898	-28	534	28.13	99
2002	1819	1910	-91	441	23.08	80
2003	1862	1928	-66	356	18.46	59
2004	2043	1990	53	405	20.35	74
2005	2017	2019	-2	390	19.32	71
2006	1992	2043	-51	339	16.59	61
2007	2075	2098	-23	317	15.11	55

Source: adapted from Earth Policy Institute 2007

[3] The price of wool increased by only 8% in five years, from US$ 477 in 2002 to US$ 514 in 2007 (FAO International Commodity Prices 2008)

[4] Since the 1980s, investment in agricultural research and investment both from overseas development assistance and government spending have gradually decreased. The proportion of overseas development assistance (ODA) to agriculture went down from 30% in early the 1980s to 10% in 2005 (Global Crop Diversity Trust 2008).

Reduced food supply and increased demand combined with the panic hoarding of food grain and profit anticipation have contributed to a rise in global food prices. This has been further reinforced by high energy prices which have raised the cost of production by increasing the costs of inputs – especially fertilisers and irrigation – and of transportation of both inputs and outputs. The price of urea fertiliser has more than doubled in just the last five years, from US$ 139 in 2003 to US$ 309 in 2007 (Table 3). The situation has been further aggravated by an increase in demand for food grain and oil seed for biofuel. For example, in 2005, the United States used 108 million tons of corn to produce ethanol (Table 4), about one-third of the total US corn production. Similarly, biodiesel production has been growing very fast in Europe. It is estimated that 2.7 million tons of oilseed is required per annum for biodiesel in Europe (USDA 2003).

Table 3: **Global Prices of Fertiliser from 2003 to 2007**

Year	Urea US$/ tonne	Price increase	% Increase
2003-04	138.9		
2004-05	175.29	36.39	26.20
2005-06	219.04	43.75	24.96
2006-07	222.95	3.91	1.79
2007-08	309.4	86.45	38.78

Source: Chand 2008

Table 4: **Use of Corn for Ethanol Production in the USA (in million tonnes)**

	2002-03	2003-04	2004-05
Corn used for ethanol production	27.1	81.6	108.9[a]
as % of US corn production	11.9	24.6	32.8
as % of global corn production	4.5	11.6	15.4

[a] Planned estimate reported by USDA.

Source: Chand 2008

Which factors are particularly important in impacting mountain communities?

The question arises of whether there are any specific factors responsible for food insecurity in the HKH region or whether it is simply driven by global forces as discussed above. Our conclusion is that although global forces have driven the higher food prices by creating imbalances between supply and demand, local and regional factors have also contributed to the process. Our main focus in this paper is on these local and regional factors, although the segregation of global and local drivers is difficult as global drivers often influence local processes through various mechanisms associated with globalisation and economic integration. These local and regional factors are discussed below.

Declining growth in grain production since the mid 1990s

From the 1980s to the mid 1990s, the increase in food grain production in the HKH was higher than the rate of population growth and the per capita availability of food grain increased in most of the HKH countries. However, since then food grain production has remained almost constant, primarily as a result of the relatively high production costs and low returns because of the low price of food grain. The real price of food grain has declined in recent years as a result of both high levels of agricultural subsidies in developed countries, and regulation of food grain prices in most of the HKH countries in an attempt to help urban consumers and poor communities. At the same time, many governments in the HKH countries have reduced their support to agriculture following the World Bank and IMF's prescription of structural adjustment programmes, and expenditure on agricultural research has declined. Equally, the benefits of any support that was provided have not reach producers due to poor management and a variety of leakages, including corruption. The food grain sector became financially less remunerative in local markets and has faced intense competition in global markets from cheap food grain produced by developed countries with high subsidies. As a result, many farmers in the HKH region have substituted food crops with other crops (Table 5) and some have even abandoned their land, as observed in Nepal, for example.

Conversion of cropland to other uses

There has been a growing trend in converting cropland to other uses as a result of increased urbanisation, industrialisation, and population growth. China lost more than 14.5 million hectares of arable land

Table 5: **Share of total crop area by crop group in India (%)**				
Crop Group	**Area share (%)**			
	1980-81	**1990-91**	**2000-01**	**2005-06**
Cereals	60.4	55.6	54.2	52.2
Pulses	13.0	13.3	11.0	11.8
Oilseeds	10.2	13.0	12.3	14.7
Sugarcane	1.5	2.0	2.3	2.2
Cotton	4.5	4.0	4.6	4.6
Horticulture	4.0	5.1	5.9	6.5
a. Condiments and species	1.2	1.4	1.5	1.6
b. Fruits and vegetables	2.8	3.7	4.4	4.9
Others	6.3	7.1	9.7	8.1
All Crops	100	100	100	100
Source: Adapted from Chand et al. 2008				

between 1979 and 1995 (Lichtenberg and Ding 2008; see also Xu et al. 2006; Chen 2007; Deng et al. 2006). Although 10.1 million hectares of arable land have been reclaimed to compensate this huge loss, this additional land is of lower quality and located in areas with less favourable climatic conditions (Ash and Edmonds, 1998 in Lichtenberg and Ding, 2008).

In addition to the conversion of cropland for other uses, there has been an increasing trend in almost all the HKH countries to substitute food crops with cash crops, including horticultural products, ginger, vegetables, and other high-value cash crops (Tulachan 2001). Demand for these commodities is growing steadily due to increased income, urbanisation, and changing dietary patterns stemming from a higher income (see Footnote 2 and Table 5). There has also been a shift in national priorities from food self sufficiency to food security through enhanced income. While the diversion from food crops to cash crops initially helped to increase farmers' incomes and enhanced food security (Partap 1995; Badhani 1998 in Tulachan 2001), **the resulting sharp increase in food crop prices has now weakened the overall food security in the HKH region.**

Abandonment of Agricultural Land

Quite a significant proportion of land has been abandoned and remains idle in the HKH region, particularly in Nepal, as a result of the low returns, a shortage of labour caused by rural out-migration for additional earnings, and highly unequal distribution of land with lack of land ownership by the tenants. Many of those who cultivate the land have no ownership rights, while the legal owners of the land are absent, leading to disincentives for investment and production. A growing number of studies from Nepal suggest that in some areas more than 30% of total cultivated land has been abandoned (Khanal and Watanabe 2006) due to such factors. As a result, the local food production system has failed to cope with the country's population growth. As mentioned above, land transfer to non-agricultural uses has strongly complemented the above process.

Degradation of Resources and Poor Support Services

Several other factors such as loss of biodiversity and common property resources, growing water stress for irrigation, recurrent crop damage due to natural hazards (such as floods and droughts), poor infrastructure (especially transport systems), and inadequate institutional support such as credit, crop insurance, and storage and processing facilities have contributed to the undermining of food security in the HKH region. These have become more prominent with the enhanced links to and dependence on plains areas. A number of the above trends are rooted largely in public interventions in mountain areas that have ignored the imperatives of mountain specific attributes, such as inaccessibility, fragility, and diversity, while extending plains-based policies and programmes to these regions (Jodha 1997).

Global Discourse on Food Security and the Implications for the HKH Region

In an effort to address the food crisis, international circles, including development agencies, humanitarian agencies, environmentalists, research organisations, and civil society, have put forward different ideas and strategies. Besides enhanced financial support to most of the affected countries to meet the emergency food crisis, several medium and long-term strategies have come into the forefront of the discussion. These include food self-sufficiency, a ban on the export of food grain, stopping the use of food grain as biofuel, and changing food habits such as replacing meat with cereals and other low energy foods. While all these points have their own merits, they are not equally applicable to every country or every region of the world. Thus it is important to examine the implications of such policies and strategies in the HKH region.

The suggested policy of ensuring food sovereignty or self-sufficiency has various implications. Local food self-sufficiency may reduce the vulnerability to external shortages and price hikes by reducing dependency on other countries. However, due to the limited area of arable land, low productivity, and limited scope for 'green revolution' type specialised crop production, it is neither practical nor economic for HKH countries like Bhutan and Afghanistan, for example, to aim for food self-sufficiency. Even if they did try, the environmental and economic costs would be very high. Given the biophysical limitations, it is better for mountain communities to try to use their arable land for producing food grain in the best way possible, while continuing to grow niche-based products based on their comparative advantage. The present imbalances in the relative price of food and cash crops might be a temporary phenomenon and could change within a short time as economic growth and increasing urbanisation are fuelling a rapid growth in the demand for high value food commodities such as fruit, vegetables, milk, and meat in the regional and global markets.

The policy of banning the export of, or imposing other restrictions on, food grain transactions and cross-border/interstate movement, though gaining popularity in the world including in several countries in the region like India, China, and Pakistan, is not a long-term solution. Although such regulatory measures may provide a short term solution for controlling prices, in the long run it does not help much, because an export ban prevents farmers from responding to the market, as market signals do not reach the food producers. Moreover, these types of restrictions give the wrong signal to producers and traders and encourage hoarding, thus undermining the objective of such policies to keep the local price low. This is not a long-term solution to food and nutrition security and is likely to have an overall adverse impact on the HKH region, which depends on external sources. Mountain areas are generally deficit in grain production and are not likely to benefit from such restrictive trade policies.

ICIMOD's Position

Long-term food security is a broad development issue. Food security cannot be achieved without enhancing livelihood options, and the livelihoods of poor communities cannot be improved unless productive resources, such as water, land, forest, rangeland, biodiversity, and the natural environment, are conserved and their access and optimal utilisation are ensured. From the mountain perspective, it is necessary, therefore, to take a holistic approach. A sustainable strategy for improving food security calls for a package of measures including strengthening upstream downstream relationships. Under its new strategy, ICIMOD is focusing on the following.

- **Enhancing income through mountain niche-based products** and resource endowments as well as enhancing livelihood options by promoting non-farm employment opportunities through rural enterprise development, mountain tourism, and higher economic value addition in marketable products
- **Reducing risks and vulnerabilities of loss of assets, crops, and lives** from natural hazards by facilitating early warning systems and establishing data and information sharing, as the HKH region is more prone to natural hazards
- **Developing options, ideas, and institutional arrangements to protect and develop watershed resources** such as land, forest, water, and biodiversity, thereby sustaining and enhancing ecosystem services, which are not only the primary basis of production but are also sources of economic (medicinal and aromatic plants, raw materials for rural enterprises,

wild foods, water for irrigation), environmental (regulating climate), and social well-being, by supporting several self-provisioning livelihood systems

- **Facilitating a more productive use of remittances**, as mountain areas have become part of a large **remittance economy,** through policy and knowledge inputs that will improve food security by stimulating rural investment and employment opportunities
- **Developing options, methodologies, and institutional mechanisms to compensate** mountain communities for the vital environmental services of which they are the custodians, such as water, flood control, biodiversity conservation, climate regulation, and dry season water flow, as well as other tangible and intangible environmental services
- **Facilitating adaptation and building resilience to achieve long-term food security** by providing relevant data, information, and knowledge generated through research by ICIMOD and its partners on climate change, glacier melting, temperature change, and air pollution including 'brown cloud' haze[5]. The agricultural productivity of the HKH region and the adjacent plains areas of ICIMOD's eight regional member countries is heavily dependent on the availability of dry season water from the Himalayan glaciers, but these are shrinking as a result of global warming, which poses a serious threat to the long-term sustainability of food production in the entire region.

References

Aufhammer, M.; Ramanathan, V.; Vincent, J.R. (2006) In *Proc. Natl. Acad. Sci. USA,* 103: 19668-19672

Chand, R. (2008) 'The Global Food Crisis: Causes, Severity and Outlook'. In *Economic & Political Weekly,* June 28, 2008

Chand, R.; Raju, S.S.; Pandey, L.M. (2008) *Progress and Potential of Horticulture in India*. Paper prepared for the 68th Annual Conference of the Indian Society of Agricultural Economics to be held in November 2008 in India

Chen, J. (2007) 'Rapid urbanization in China: A real challenge to soil protection and food security'. In *Catena,* 69: 1-15

Deng, X.; Huang, J.; Rozelle, S.; Uchida, E. (2006) 'Cultivated land conversion and potential agricultural productivity in China'. In *Land Use Policy,* 23: 372-384

Earth Policy Institute (2007) Eco-Economy Updates. Available at http://www.earth-policy.org/Updates/index.htm

FAO (2008a) *World Food Situation: High Food Prices*. Available at http://www.fao.org/worldfoodsituation/FoodPricesIndex/en/ accessed on 28 July 2008

FAO (2008b) *Global Food Outlook: Market Analysis*, June 2008. Rome: FAO

Jodha N.S. (1997) 'Mountain Agriculture. In B. Messerli and J.D. Ives (eds) *Mountains of the World: A Global Priority* (A Contribution to Chapter 13 of Agenda 21) pp.313-335. New York: The Panthenon Publishing Group

Khanal, N.R.; Watanabe, T. (2006) 'Abandonment of Agricultural Land and Its Consequences: A Case Study in the Sikles Area, Gandaki Basin, Nepal Himalaya'. In *Mountain Research and Development,* 26 (1): 32-40

Lichtenberg, E.; Ding, C. (2008) Assessing farmland protection policy in China. In *Land Use Policy,* 25: 59-68

Partap T. (1995) *High Value Cash Crops in Mountain Farming: Mountain Development Processes and Opportunities*. Kathmandu: ICIMOD

Ramanathan, V.; Chung, C.; Kim, D.; Bettge, T.; Buja, L.; Kiehl, J.T.; Washington, W.M.; Fu, Q.; Sikka, D.R.; Wild, M. (2005) 'Atmospheric brown clouds: Impacts on South Asian climate and hydrological cycle'. In *Proc. Natl. Acad. Sci. USA,* 102: 5326-5333

Tulachan, P.M. (2001) 'Mountain Agriculture in the Hindu Kush-Himalaya: A Regional Comparative Analysis'. In *Mountain Research and Development,* 21(3): 260-267

von Braun, J. (2007) *The World Food Situation: New Driving Forces and Required Actions*. IFPRI's Biannual Overview of the World Food Situation presented to the CGIAR Annual General Meeting held in Beijing, China, in December 2007

Xu, Z.; Xu, J.; Deng, X.; Huang, J.; Uchida, E.; Rozelle, S. (2006) '*Grain for Green versus Grain: Conflict between Food Security and Conservation Set-Aside in China'*. In *World Development,* 34(1): 130-148

USDA (United States Department of Agriculture) (2003) *EU: Biodiesel Industry Expanding Use of Oilseeds*. USDA Production Estimates and Crop Assessment Division, Foreign Agricultural Service, available at: http://www.fas.usda.gov/pecad2/highlights/2003/09/biodiesel3/

[5] Recent research has shown that 'brown cloud' haze has reduced the amount of sunlight reaching the surface to an extent that can have a significant impact on agricultural yields across large regions of South and East Asia (Aufhammer 2006). The haze could also have a significant impact on regional climate and hydrological cycles (Ramanathan et al. 2005). Additional research is required and mitigation measures will be essential for the maintenance of the present standards of productivity.